Please add the following claim:

49. The system described in claim 15, wherein the converter and the device maintain a substantially constant voltage across the DC bus.

REMARKS

Entry of this amendment and reconsideration and allowance of the above-identified patent application are respectfully requested. Claims 1-48 were rejected. Claims 1, 10, 15, and 39 have been amended. Claim 49 has been added. Upon entry of this amendment, claims 1-49 will be pending in the application.

In the Official Action, claims 1-48 stand rejected under 35 U.S.C. § 102 (a) as allegedly being anticipated by Rajashekara (U.S. Patent No. 6,321,145). Also, the Office Action has rejected claims 1-48 as allegedly being anticipated by Reimers (U.S. Patent No. 4,054,827).

The present invention is directed to converting direct current (DC) electrical voltage from a DC power source (*e.g.*, a fuel cell) to an alternating current (AC) voltage. In one embodiment, recited in claim 15 as amended, a system converts the DC power using a DC-to-AC inverter coupled to a DC bus. Also, a converter (*e.g.*, a boost converter) coupled to the DC bus and to the DC power source, maintains a substantially constant voltage on the DC bus by regulating power from the DC power source. The system also includes a battery, and a device coupled to the battery and to the converter

that controls the flow of current to and from the battery. The system controls power from the battery based on DC power available from DC power source so as to maintain a substantially constant voltage on the DC bus, despite the fluctuating voltage provide by the DC power source. Support for the amendment to claim 15 is found throughout the present specification and specifically on page 7, lines 3-21. Applicants respectfully assert that Neither Rajashekara nor Reimers anticipate the present invention, as amended.

The Office Action first contends that the present invention is anticipated under 35 U.S.C. § 102 (a) over Rajashekara. However, Rajashekara does not provide the ability to control power from the battery based on DC power available from the DC power source. Instead, Rajashekara discloses a DC/DC boost converter 38 connected in parallel with a power battery 22 and with a fuel cell unit 24 (*Rajashekara* – Figure 1). Rajashekara's "boost converter receives dc electric voltage from the fuel cell unit and boosts the output dc voltage to the same level as the power battery. An inverter [40] receives dc electric voltage from the power battery and the boosted dc electric voltage from the dc/dc boost converter and outputs ac electric voltage." (*Rajashekara* – column 3, lines 36-41).

Therefore, Rajashekara's boost converter controls the voltage from the fuel cell to the inverter, but does not also control the voltage from the battery to the inverter as a function of power available from the fuel cell. In other words, nowhere does Rajashekara disclose or suggest controlling power from the battery as a function of power available from the fuel cell. As a result, Rajashekara forces the voltage of the dc bus to remain

fixed. Such control, on the other hand, is provided by the present invention's boost converter 103 and charge/discharge controller 113.

Rajashekara's configuration results in various disadvantages. For example, as is well known to those skilled in the art, an inverter typically draws power from the DC bus at a frequency that is twice that of the inversion frequency, thus resulting in a significant 120 Hz ripple component on the DC bus when the inverter produces 60 Hz power. Rajashekara forces all of the ripple voltage drawn from the DC bus to come from the battery or fuel cell. As a result, Rajashekara adversely reduces the battery life and may damage the fuel cell.

In view of these shortcomings in Rajashekara, withdrawal of the rejection of claims 1-48 as being anticipated under 35 U.S.C. § 102 (a) by Rajashekara is believed proper and is respectfully solicited.

The Office Action next contends that the present invention is anticipated by Reimers under 35 U.S.C. § 102 (a). For the reasons stated above with respect to the rejection under 35 U.S.C. § 102 (a) over Rajashekara, withdrawal of the rejection of claims 1-48 as allegedly being anticipated is believed proper and is respectfully solicited.

CONCLUSION

In view of the foregoing amendments and remarks, the present application is believed to be in condition for allowance, and a Notice of Allowability is respectfully solicited. In the event that the Examiner cannot allow the present application for any reason, the Examiner is encouraged to contact the undersigned attorney, Vincent J. Roccia at (215) 564-8946, to discuss resolution of any remaining issues.

Attached hereto are pages showing the marked-up version of the changes made to the claims by the current amendment.

Respectfully submitted,

Date: **October 24, 2002**

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Marked up versions of claims 1, 10, 15, and 39, which are amended herein, showing all of the changes relative to the previous version of each.

1. A method for converting direct current (DC) electrical voltage from a DC power source to an alternating current (AC) voltage, comprising:

controlling DC power from the DC power source, wherein the DC power source provides varying DC voltage;

[drawing] <u>controlling</u> DC power from a battery based on DC power available from the DC power source;

maintaining a substantially constant DC voltage on a DC bus; and

inverting the DC voltage from the DC bus to the AC voltage.

10. A method for converting direct current (DC) electrical voltage from a DC power source to an alternating current (AC) voltage, comprising:

controlling DC power from the DC power source, wherein the DC power source provides varying DC voltage;

providing DC power to a battery based on DC power available from the DC power source;

<u>controlling power from the battery;</u>

maintaining a substantially constant DC voltage on a DC bus; and

inverting the DC voltage from the DC bus to the AC voltage.

15. A system for converting DC electrical voltage from a DC power source to an AC voltage, wherein the DC power source provides varying DC voltage, the system comprising:

a DC-to-AC inverter;

a DC bus coupled to the DC-to-AC inverter;

a converter coupled to the DC bus and to the DC power source that [maintains a substantially constant voltage on the DC bus by regulating]regulates power from the DC power source;

a battery; and

a device coupled to the battery and to the converter, wherein the device controls the flow of current to and from the battery, and wherein power is controlled from the battery based on DC power available from the DC power source.

39. A device for converting electrical voltage from a fuel cell to an AC voltage, comprising:

a DC bus;

an inverter coupled to the DC bus, wherein the inverter converts DC voltage from the DC bus to an AC voltage;

a battery;

a device coupled to the battery and to the DC bus, wherein the device controls the flow of current to and from the battery, and wherein power is controlled from the battery based on DC power available from DC power source; and

a boost converter coupled to the fuel cell, wherein the boost converter maintains a substantially constant DC voltage on the DC bus by regulating power from the fuel cell, and wherein the boost converter provides a charging current to the battery, and wherein the boost converter protects current from flowing to the fuel cell.